

Three New Species of *Huberia* (Melastomataceae) from Peru

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ABSTRACT. Three new Andean species of the genus *Huberia* DC. are described and illustrated. These species were found between 1500 and 3350 m in restricted areas of northwestern Peru. The presence of staminodes in *H. staminodia* represents a new record for this floral structure for *Huberia*. A key is also provided for the four species of *Huberia* occurring in the Andean region: *H. cogniauxii*, *H. peruviana*, *H. staminodia*, and *H. weberbaueriana*.

Huberia DC. is a neotropical genus of 16 species, the majority of which occur in eastern Brazil. Only one species, *H. peruviana*, was known to occur in Andean Ecuador and Peru. During a recent taxonomic revision of this genus (Baumgratz, 1997), species new to science were discovered, of which three, *H. cogniauxii*, *H. staminodia*, and *H. weberbaueriana*, from the Peruvian Andes are described, illustrated, and mapped (Fig. 1).

Huberia staminodia Baumgratz, sp. nov. TYPE: Peru. Depto. Amazonas: Province of Bongará, between río Utcubamba and Shipashamba, 4 km from Campomiento Ingenio, altitude 1520 m, 2 Feb. 1964, P. C. Hutchinson & J. K. Wright 3995 (holotype, NY; isotypes, F, K, US, USM). Figure 2.

Frutices ca. 1 m alta, indumento glanduloso-furfuraceo etiam gemmis vegetativis glanduloso-vilosis; ramis tetragonis. Folia membranacea, anguste ovata vel elliptica, trinervia, margine integra vel apice crenata; domatia petiolaria tubulosa interdum leviter inflata. Flores saepe 4-meri, interdum 5-meri, hypanthio 8-anguloso, interdum 10-, calycis laciniis aequi-inaequilongisve, anguste triangularibus; petalis ellipticis vel angusto-obovatis, apice acutis, staminibus fertilibus et staminodiis, loculis antherarum sinuatis. *Huberia staminodia* affinis *H. peruviana*, *H. weberbaueriana* et *H. cogniauxii* sed praesertim staminodiis praesentibus differt.

Shrub ca. 1 m high; branches, leaves, inflorescences, bracts, prophylls, pedicels, hypanthium, and calyx glandular-furfuraceous, the vegetative shoots and their adjacent axillary regions also glandular-villous. Branches quadrangular, gray and sulcate, brownish when young. Petioles 0.5–1.5 cm long, the apex with one pair of tubular domatia, sometimes slightly inflated. Leaf blades 2.5–6.4 ×

1.2–2.4 cm, membranaceous, narrowly ovate to elliptic, the base acute, the apex acute-acuminate, the margin entire or basal $\frac{2}{3}$ entire and distal $\frac{1}{3}$ crenulate, 3-nerved with the lateral veins arising at the base, the central secondary veins 10–13 pairs, transverse to oblique-ascendant. Inflorescences terminal, sessile, cymoids (Troll, 1969), corymbose or not, 2.5–3.5 cm long, with 15–25 flowers, the branches 2(–4), as triads or sometimes umbelliform cymes with 5 flowers, distal node a triad or umbelliform cyme with 9 or 13 flowers; bracts 2–21 × 0.5–9.0 mm, foliaceous, petiolate to sessile, membranaceous to thickened, ovate to elliptic or linear, slightly concave, the apex acute to obtuse, the margin entire or sometimes distal $\frac{1}{3}$ crenulate; prophylls 1–2, 1–3 × 0.2–0.5 mm, thickened, oblong to linear. Flowers 4(–5)-merous; pedicel 6.0–7.5 mm long, obtusely quadrangular; hypanthium 3.1–4.0 × 2.0–2.5 mm, tubular, 8-angled, the apex slightly constricted; calyx lobes equal or unequal in size, (0.5–0.8)1.0–1.5 × (0.6–)0.8–1.1 mm, narrowly triangular, angled at abaxial surface, the base laminar, rigidly membranaceous, the apex thickened, subterete, oblong, rounded; petals white, 10–11 × 3.0–4.3 mm, elliptic to obovate, the apex acute; fertile stamens 4–5(6–7), unequal in size, antisealous and/or antipetalous, yellow, the filaments 5.8–6.3 mm long, the anthers narrowly triangular, the base symmetric or asymmetrically lobed, the thecae 4.5–5.6 mm long, undulate, bilocular to pseudo-bilocular to the apex, the tube unilocular, 0.3–0.4 mm long, the connective appendage 1.5–2.1 mm long, dorsal, filiform, straight or zigzag-shaped, sometimes absent; staminodia (1–2)3–4, antipetalous, subisomorphic, yellow, 7.5–9.5 mm long, filiform, the apex subulate, sigmoid to sinuous or sometimes zigzag-shaped; ovary $\frac{1}{5}$ – $\frac{6}{7}$ (– $\frac{7}{8}$) free, 3.8–4.0 × 2.0–2.1 mm, 4-locular, the ovules 1.1–1.3 mm long; style 12.0–12.5 mm long, subterete, the stigma punctiform. Fruit a ruptidium (a capsular fruit type; Baumgratz, 1997), 18–19 × 5.2–5.5 mm, the hypanthium and calyx persistent, urceolate, the apex slightly 8-angled, the pedicel 9–10 mm long; seeds 300–350, 2.2–4.0 × 0.4–0.7 mm, winged, linear to narrowly elliptic or ovate; embryo 0.4–0.7 mm long.

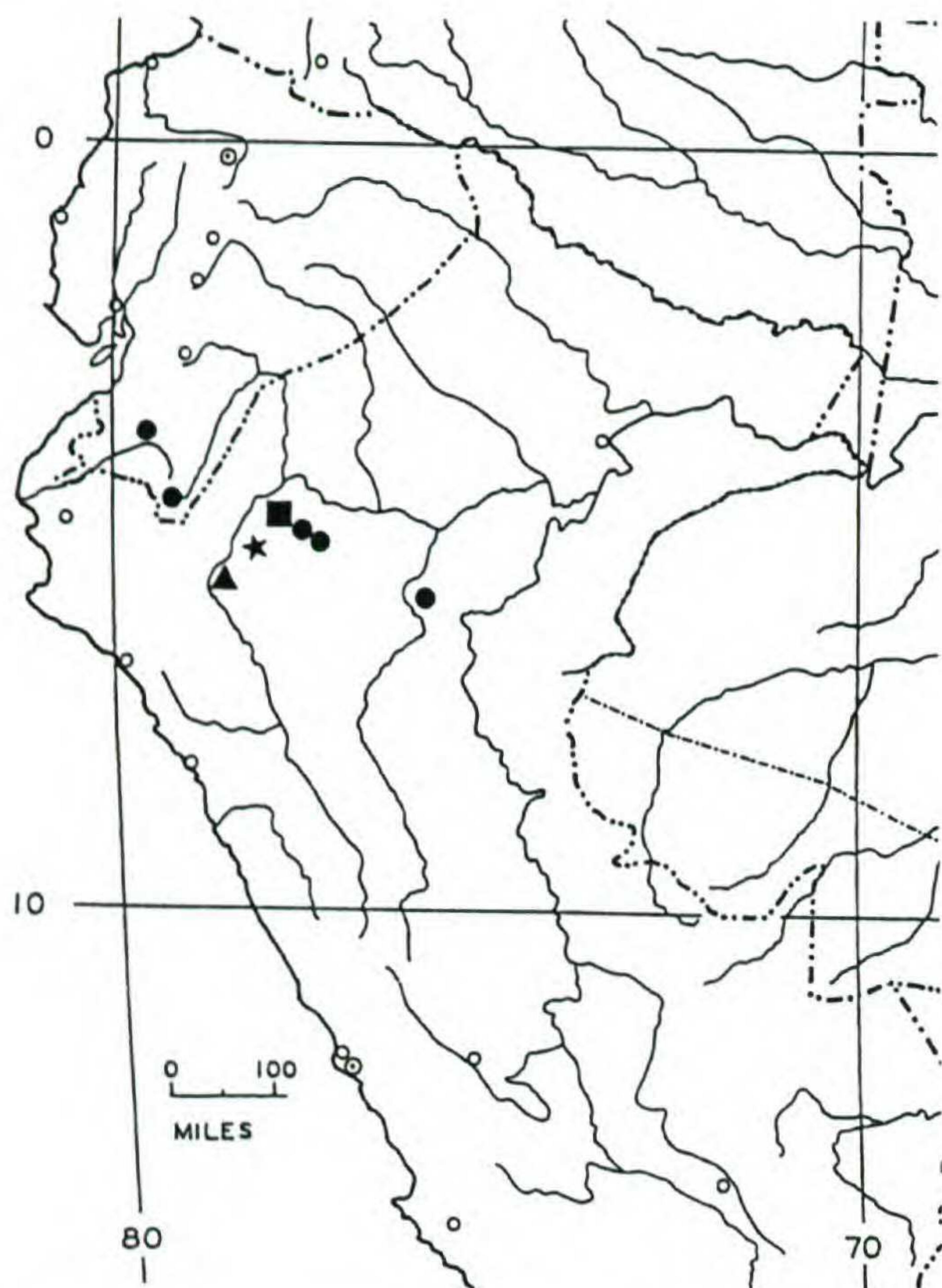


Figure 1. Geographic distribution of the Andean species of *Huberia* DC.: *H. cogniauxii* (▲), *H. peruviana* (●), *H. staminodia* (★), and *H. weberbaueriana* (■).

Distribution. *Huberia staminodia* is known only from the type collection. It is endemic to northwestern Peru, between the Utcubamba and Shipasbamba rivers, in the cloud forests of Cordillera Central or Oriental, Prov. Bongará, at 1520 m. This phytogeographic region is named Ceja de la Montaña, more precisely Ceja del Marañón, where the presence of clouds is observed throughout the year (Weberbauer, 1945). It is described by Young and León (1993) as a region of moist forest of the oriental slopes.

Huberia staminodia is unique in the genus because of its staminodia. The tubular domatia in the petioles and 5-merous flowers also distinguish this species from the other Peruvian species. The inflorescences are very condensed and short, with 15, 19, 21, and 25 flowers. The most frequent androecium pattern in the tetramerous flowers is five fertile stamens and three staminodia, but the proportion 4:4 and sometimes 6-7:1-2 is also encountered in the same specimen. In the pentamerous flowers the androecium has seven fertile stamens and three staminodia. In both types of flowers the staminodia are always antipetalous, alternating with the fertile stamens. As observed in all species of *Huberia*, the fruit is an interesting capsule type: it was termed a ruptidium by Baumgratz (1997). It

is composed of the mature ovary and the urceolate hypanthium and calyx. In the mature fruit, it is necessary for the hypanthium and calyx to open by irregular dehiscence in order for the seeds to be dispersed; the mature ovary has loculicidal and septifragal dehiscence. Flowering and fruiting in February.

***Huberia weberbaueriana* Baumgratz, sp. nov.**

TYPE: Peru. Depto. Amazonas: Prov. Bongará, below San Carlos, 1700 m, June 1915, A. Weberbauer 7145 (holotype, US; isotypes, F, GH). Figure 3.

Plantae indumento glanduloso-furfuraceo, gemmis vegetativis, petiolis et supra junioribus foliorum indumento glanduloso-villosis ornatis; ramis tetragonis. Folia rigido-membranacea, anguste ovata vel elliptica, margine basi integro apiceque serrulato, trinervia. Domatia laminaria marsupiformia interdum junioribus foliis carentia. Flores 4-meri, hypanthio 8-anguloso, calycis laciniis anguste triangularibus, petalis oblongis vel ellipticis, stigma capitatis. *Huberia weberbaueriana* affinis *H. cogniauxii* sed praesertim marginalibus nervis secundariis in basi non confluentibus cum lateralibus nervis principalibus, floribus et fructibus longioribus, petalis apice acuto vel obtuso-apiculato, antherarum thecis manifeste sinuatis differt.

Plants with branches, leaves, inflorescences, bracts, prophylls, pedicels, hypanthium, and calyx glandular-furfuraceous, the vegetative shoots and their adjacent axillary regions, and the petioles and adaxial surface of the foliar blade when young also glandular-villous. Branches subquadrangular, striate when young. Petioles 0.6–1.1 cm long. Leaf blades 2.6–5.8 × 1.0–1.9 cm, rigidly membranaceous, narrowly ovate to elliptic, the base acute or sometimes obtuse, the apex acuminate, the basal margin 1/3 entire and distal 2/3 conspicuously to slightly serrulate, 3-nerved with the lateral veins arising at the base, the marginal secondary veins inconspicuous and confluent to lateral primary veins at the base, the central secondary veins 12–15 pairs, oblique-ascendant; abaxial surface with marsupiform laminar domatia, sometimes absent in young leaves, apiculate at border of the membrane. Inflorescences terminal, sessile, corymbose cymoids (Troll, 1969), 2.5–3.0 cm long, with 11–19 flowers, the branches 2–4, frequently as triads or sometimes umbelliform cymes with 4 flowers, distal node usually an umbelliform cyme with 5 flowers or sometimes a triad; bracts membranaceous, foliaceous, 9–23 × 1.5–10.0 mm, petiolate, narrowly elliptic, the apex acute, the margin entire or sparsely serrulate to the apex, or bracts thickened, 1.4–5.0 × 0.2–0.5 mm, sessile, oblong, slightly concave, the apex obtuse, the margin entire; prophylls

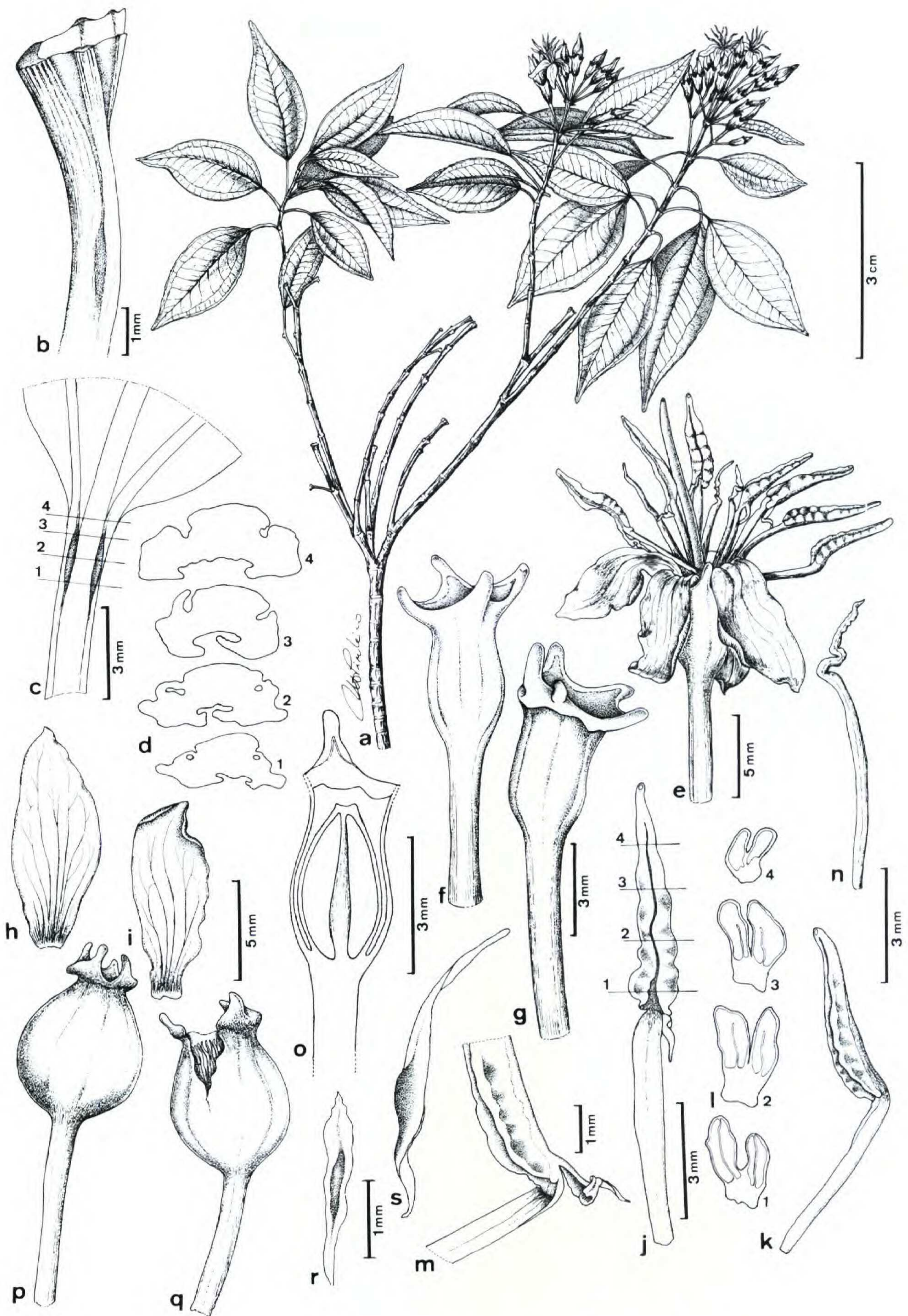


Figure 2. *Huberia staminodia* Baumgratz. —a. Flowering branches. —b, c. Details of petiolar domatia. —d. Transverse petiole sections at levels in c, illustrating the cavities of the domatia. —e. Flower. —f, g. Pedicel, hypanthium, and the calyx with four and five lobes, respectively. —h, i. Petals. —j, k. Fertile stamens. —l. Transverse anther sections at levels in j, illustrating loculi and septa. —m. Detail of the connective appendage. —n. Staminiodium. —o. Longitudinal ovary section showing the partial adnation to the hypanthium. —p, q. Fruits. —r, s. Seeds.



Figure 3. *Huberia weberbaueriana* Baumgratz. —a. Flowering branches. —b. Detail of the foliar indument. —c–e. Details of the laminar domatia. —f. Transverse leaf base sections at levels in c, illustrating the cavities of the domatia. —g, h. Bracts: foliaceous and petiolate, and thickened and sessile, respectively. —i. Prophyll. —j. Flower. —k. Pedicel, hypanthium, and calyx. —l. Calyx lobe. —m, n. Petals. —o, p. Longer and shorter stamens, respectively. —q. Ovary. —r. Style.

1–2, 0.4–0.6 × 0.1–0.2 mm, linear. Flowers 4-merous; pedicel 9–11 mm long, quadrangular; hypanthium 5.5–6.2 × 2.5–3.0 mm, tubular, 8-angled, the apex slightly constricted; calyx lobes 1.5–1.9 × 0.5–0.6 mm, narrowly triangular, angled at abaxial surface, the base laminar, rigidly membranaceous, the apex thickened, subterete, oblong, rounded; petals white, 12–14 × 4.5–5.8 mm, oblong to elliptic, the apex acute to obtuse-apiculate; stamens of two sizes, yellow, the antipetalous stamens longer than the antisepalous, the filaments of the longer 6.0–6.8 mm long, of the shorter 5.2–6.1 mm long, the anthers narrowly triangular, the thecae of the longer 6.5–7.3 mm long, of the shorter 5.6–6.2 mm long, conspicuously undulate, bilocular to unilocular to the apex, the tube unilocular, 0.3–0.4 mm long, connective appendage 3.5–4.4 mm and 4.2–4.4 mm long, dorsal, filiform, straight or zigzag-shaped, the apex apiculate or sometimes asymmetrically uni- or bi-apiculate; ovary $\frac{3}{4}$ – $\frac{5}{6}$ free, 4.0–4.8 × 2.3–2.7 mm, 4-locular, the ovules 0.6–1.6 mm long; style 14–16 mm long, the stigma capitate. Mature fruit not seen; young fruit 17.0–17.5 × 2.8–3.0 mm, urceolate, 8-angled, the pedicel 9–10 mm long, striate.

Distribution. *Huberia weberbaueriana* is known only from the type collection. It is endemic to northwestern Peru, where it occurs near the city of San Carlos at 1700 m and in the same phytogeographic region as the other Peruvian species of *Huberia*. Given the altitude and based on the study of Young and León (1993), this new species may occur on the rainforest slopes of Ceja de la Montaña or in cloud forests situated in moist forest at higher elevations of the oriental slopes.

Huberia weberbaueriana may be distinguished from the other Andean species of *Huberia* by its marsupiform laminar domatia, longer size of the flowers, fruits and their pedicels, the stamens of two sizes, the thecae conspicuously undulate, and the stigma capitate. The long glandular hairs in the vegetative shoots and their adjacent axillary regions are early caducous and they may be obscured by a viscous substance in dried specimens. Usually each leaf has a pair of domatia, but some specimens have only one and on young leaves the domatia may not be observed. The inflorescences are condensed and short, with 11, 15, 17, and 19 flowers. This new species seems most closely related to *H. cogniauxii*, but the latter has leaves with marginal secondary veins confluent to the lateral primary veins above the base, shorter flowers and flower parts, and the thecae with its surface smooth to slightly undulate. Flowering and with young fruits in June.

Huberia cogniauxii Baumgratz, sp. nov. TYPE: Peru. Depto. Amazonas: Prov. Bongará, Laguna Pomacocha, ridge NE of lake, 77°52'W, 5°50'S, elev. 3350–2450 m, 7 Feb. 1985, B. Stein & C. Todzia 2116 (holotype, MO; isotypes, CAS, RB). Figures 4, 5.

Arbores, indumento glanduloso-furfuraceo etiam gemmis vegetativis glanduloso-vilosis, ramis tetragonis vel subtetragonis. Folia rigido-membranacea, anguste elliptica, margine basi integro apiceque serrulato, trinervia. Domatia laminaria marsupiformia. Flores 4-meri, hypanthio leviter 8-anguloso, calycis laciniis anguste triangularibus, petalis ellipticis. *Huberia cogniauxii* affinis *H. weberbaueriana* sed praesertim marginalibus nervis secundariis et lateralibus principalibus foliorum basi confluentibus, floribus et fructibus minoribus, petalis apice acuminatis, antherarum thecis planis vel leviter sinuatis et stigma capitatis differt.

Small tree ca. 3 m high. Branches, leaves, inflorescences, bracts, prophylls, pedicels, hypanthium, and calyx glandular-furfuraceous, the vegetative shoots and their adjacent axillary regions also glandular-villous. Branches quadrangular to subquadrangular, striate when young. Petioles 0.6–1.0 cm long. Blades 3.4–5.0 × 1.1–1.8 cm, rigidly membranaceous, narrowly elliptic, the base acute, the apex acuminate, the basal margin $\frac{1}{3}$ entire and distal $\frac{2}{3}$ serrulate or sparsely serrulate, 3-nerved with the lateral veins arising at the base, the marginal secondary veins tenuous and confluent to lateral primary veins above the base, the central secondary veins 10–14 pairs, oblique-ascendant; abaxial surface with marsupiform laminar domatia, apiculate at the border of the membrane. Inflorescences terminal, sessile, cymoids (Troll, 1969), corymbose or not, 2.5–3.7 cm long, with 19–27 flowers, the branches 4–6, frequently as triads or sometimes sessile monads or triads or umbelliform cymes with 5 flowers, distal node a triad or umbelliform cyme with 7 flowers; bracts membranaceous, foliaceous, 10–20 × 2.2–4.8 mm, petiolate, narrowly elliptic, the apex acuminate, the margin inconspicuous and sparsely serrulate to the apex, or bracts thickened, 1.4–1.5 × 0.3–0.4 mm, sessile, oblong, slightly concave, the apex rounded, the margin entire; prophylls 1–2, 0.4–0.8 × 0.1–0.2 mm, oblong. Flowers 4-merous; pedicel 5.5–6.0 mm long, terete; hypanthium 3.8–4.5 × 1.8–2.1 mm, tubular, slightly 8-angled, the apex slightly constricted; calyx lobes 1.1–1.3 × 0.3–0.5 mm, narrowly triangular, angled at abaxial surface, the base laminar, rigidly membranaceous, the apex subterete, oblong, thickened, rounded; petals white, 9.2–9.8 × 3.1–3.5 mm, elliptic, the apex acuminate; stamens of two sizes, yellow, the antipetalous stamens longer than the antisepalous, the filaments of the longer 5.7–6.0 mm



Figure 4. *Huberia cogniauxii* Baumgratz. —a. Flowering branches. —b. Adaxial surface of the leaf showing the marginal secondary veins confluent to lateral primary veins above the base. —c. Abaxial surface of the leaf showing the pair of domatia and the marginal secondary veins confluent to lateral primary veins above the base. —d, e. Bracts: foliaceous and petiolate, and thickened and sessile, respectively. —f. Prophyll. —g. Flower bud. —h. Flower.

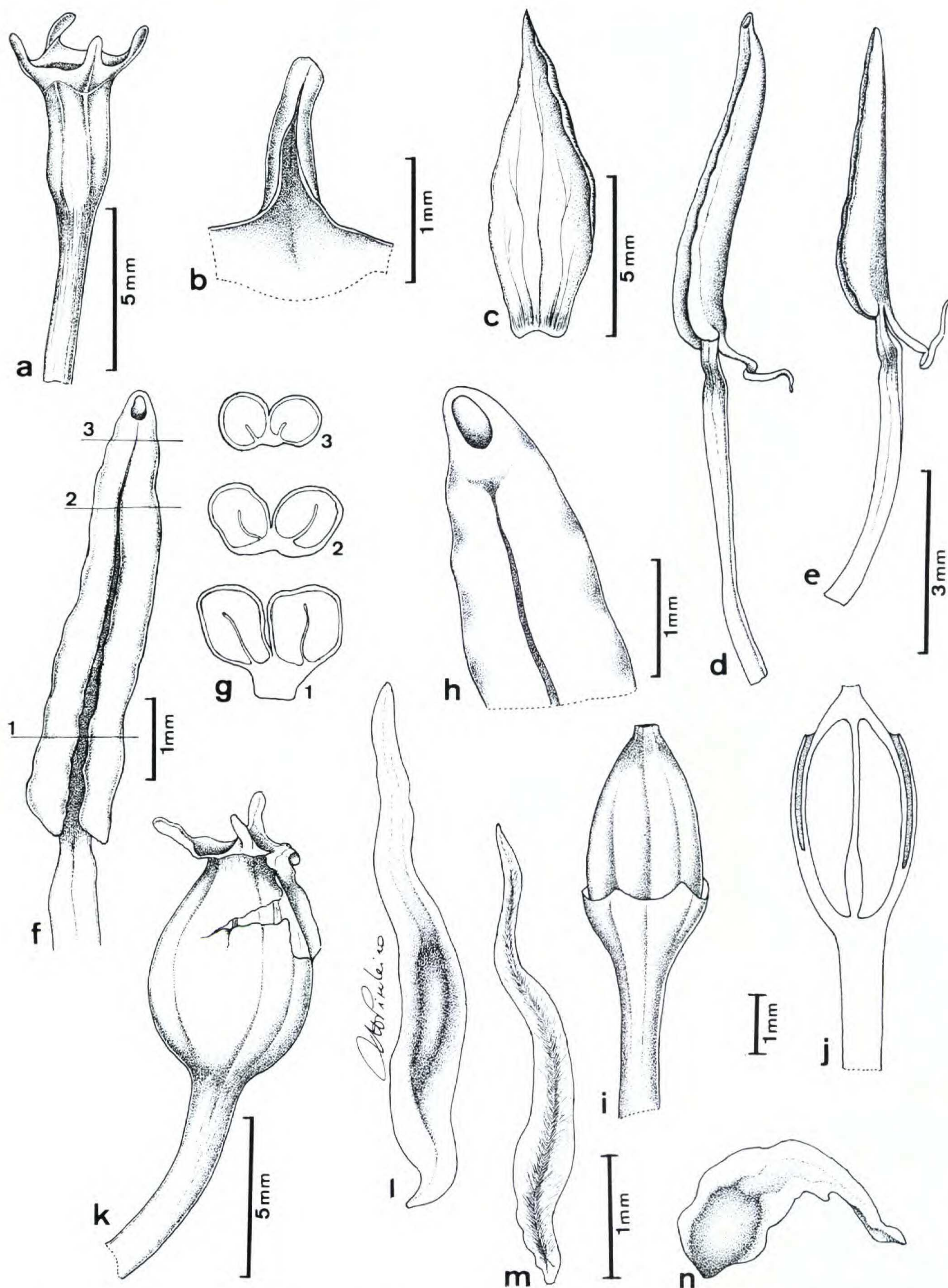


Figure 5. *Huberia cogniauxii* Baumgratz. —a. Pedicel, hypanthium, and calyx. —b. Calyx lobe. —c. Petal. —d, e. Longer and shorter stamens, respectively. —f, g. Anther: adaxial surface and transverse sections at levels in f, illustrating loculi and septa, respectively. —h. Detail of the pore. —i. Ovary. —j. Longitudinal ovary section showing the partial adnation to the hypanthium. —k. Fruit. —l–n. Seeds.

long, of the shorter 5.0–5.2 mm long, the anthers oblong-subulate, the thecae of the longer 5.1–5.5 mm long, of the shorter 4.5–4.7 mm long, smooth to slightly undulate, pseudo-bilocular to unilocular to the apex, the tube unilocular, 0.2–0.3 mm long, the connective appendage 1.3–1.8 mm and 1.5–2.4 mm long, dorsal, filiform, zigzag-shaped; ovary $\frac{3}{4}$ – $\frac{1}{5}$ free, 3.5–3.8 × 1.7–1.8 mm, 4-locular, the ovules 0.6–0.9 mm long; style 11–13 mm long, the stigma capitate. Fruit a ruptidium (a capsular fruit type; Baumgratz, 1997), 11–13 × 4.5–5.0 mm, the hypanthium and calyx persistent, urceolate, inconspicuously 4-angled, the pedicel 5.5–6.5 mm long; seeds 275–295, (1.4)2.4–4.5 × 0.3–0.6(0.7) mm, winged, linear, rarely narrowly ovate, sometimes sinuous; embryo (0.5)0.6–0.8 mm long.

Distribution. *Huberia cogniauxii* is known only from the type collection. It is endemic to northwestern Peru, occurring at 2450–3350 m in Bongará Province. This region is characterized by cloud forests with rocky places, according to the collectors B. Stein and C. Todzia. The new species is situated in the moist forest of the oriental slopes of Cordillera Central, as described in the study of Young and León (1993).

Huberia cogniauxii is distinguished by leaves with marginal secondary veins confluent to the lateral primary veins above the base, marsupiform laminar domatia, short length of the pedicels, petals, and fruits, short width of the calyx lobes, androecium only with fertile stamens of two sizes, thecae smooth to slightly undulate, stigma capitate, and lesser number of seeds per fruit. Frequently, as observed in the other species of this genus (Baumgratz, 1997), all the indument of the dried specimen is obscured by a viscous substance, inclusively the glandular hairs of the vegetative shoots and their adjacent axillary regions, that are also early caducous. The inflorescences are very condensed and short, with 19, 21, 23, and 27 flowers. Flowering and with fruits in February.

KEY TO THE ANDEAN SPECIES OF *HUBERIA*

- 1a. Leaves with tubular petiolar domatia; flowers generally 4-merous or sometimes 5-merous; androecium with stamens and staminodia *H. staminodia* Baumgratz
- 1b. Leaves with marsupiform, petiolar, or laminar domatia, flat or like two inflated pockets on the petioles; flowers always 4-merous; androecium with all stamens fertile.
- 2a. Leaves with petiolar domatia forming two inflated pockets at the apex; calyx lobes 2.1–2.5 mm long; stigma punctiform; fruits 20–26 × 5–7 mm, the pedicel 11–15 mm long *H. peruviana* Cogniaux
- 2b. Leaves with laminar domatia; calyx lobes 1.1–1.9 mm long; stigma capitate; fruits 11.0–17.5 × 2.8–5 mm, the pedicel 2.3–10.0 mm long.
- 3a. Leaf blades narrowly ovate to elliptic, the marginal secondary veins confluent to lateral primary veins at the base; pedicel 9.0–11.0 mm long; hypanthium 5.5–6.2 mm long; calyx lobes 1.5–1.9 mm long; petals 12.0–14.0 × 4.5–5.8 mm; thecae 5.6–7.3 mm long, conspicuously undulate; style 14.0–16.0 mm long *H. weberbaueriana* Baumgratz
- 3b. Leaf blades narrowly elliptic, the marginal secondary veins confluent to lateral primary veins above the base; pedicel 5.5–6.0 mm long; hypanthium 3.8–4.5 mm long; calyx lobes 1.1–1.3 mm long; petals 9.2–9.8 × 3.1–3.5 mm; thecae 4.5–5.5 mm long, smooth to slightly undulate; style 11.0–13.0 mm long *H. cogniauxii* Baumgratz

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